

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today
(1) was not written for publication in a law journal and
(2) is not binding precedent of the Board.

Paper No. 16

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte JOHN C. EHMKE

Appeal No. 1997-3443
Application No. 08/595,901

ON BRIEF

Before URYNOWICZ, THOMAS, and KRASS, Administrative Patent Judges

DECISION ON APPEAL

This appeal is from the final rejection of claims 13-16, 19-22 and 25-28.

The invention pertains to infrared focal plane photodiode arrays. Claim 13 is illustrative and reads as follows:

13. A diode comprising:

- (a) a substrate of p-type group II-VI semiconductor material having a crystal lattice structure;

(b) an electrically conductive material extending into said lattice structure, said electrically conductive material forming an ohmic contact with said substrate and damaging said lattice structure by extending into said lattice structure to provide by said damage an n-type region in said substrate in said damaged lattice region and in a regions [sic] adjacent to and intimate with said electrically conductive material within said lattice structure; and

(c) an electrical contact to the p-type substrate.

The references relied upon by the examiner as evidence of obviousness are:

Wotherspoon	4,411,732	Oct. 25, 1983
Baker	4,521,798	Jun. 04, 1985
Mc Adoo et al. (Mc Adoo)	5,451,769	Sep. 19, 1995

Claims 13, 14, 19, 20, 25 and 26 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Baker.

Claims 13-16, 19-22 and 25-28 are rejected under 35 U.S.C. § 103 as being unpatentable over Baker in view of Mc Adoo.

The respective positions of the examiner and the appellant with regard to the propriety of these rejections are set forth in the final rejection (Paper No. 7) and the examiner's answer and supplemental answer (Paper Nos. 11 and 13, respectively) and the appellant's brief and reply briefs (Paper Nos. 10, 12 and 14, respectively).

Appellant's Invention

As noted in the examiner's answer, the summary of the invention contained in the brief is correct. Reference is made to that summary.

The Prior Art

Baker illustrates in Figures 1-6 an array of photovoltaic radiation detector elements 10 formed in a p-type substrate 14 of infrared-sensitive material (cadmium mercury telluride, HgCdTe) having a crystal lattice structure. Electrically conductive material 23 extends into the lattice structure. N-type regions 13b are formed by ion etching of the structure so as to form diodes having p-n junctions 12. Electrical contacts 24 are connected to the p-type substrate 14. The above array is mounted on a substrate 1 comprising circuit elements for processing signals derived from the array. Substrate 1 includes conductive elements 2, 3.

Mc Adoo discloses a photodetector. At column 3, lines 30-44, it is disclosed that tungsten is used for electrically contacting HgCdTe.

Opinion

After consideration of the positions and arguments presented by both the examiner and the appellants, we have concluded that the rejections should be sustained. We agree in general with the comments made by the examiner; we add the following discussion for emphasis.

With respect to the rejection of claims 13, 14, 19, 20, 25 and 26 under 35 U.S.C. § 102(b) as being anticipated by Baker, electrically conductive material 23 extends into the lattice structure of the substrate 13b, 14 and forms an ohmic contact with the substrate. Material 23 clearly provides the ohmic contact to connect the n-type side wall regions 13b to conductor elements 2 and 3. See column 10, lines 6-10. Thus, no merit exists in appellant's position that Baker does not disclose an electrically conductive material which extends into the lattice structure of the substrate and forms an ohmic contact with the substrate.

Appellant argues that Baker does not teach or suggest electrically conductive material damaging the lattice structure by extending into said lattice structure. This is a process limitation which is entitled to no patentable weight in appellant's apparatus claim. Appellant has effectively admitted that process limitations in product claims are entitled to no weight at page 2 of his reply brief filed July 8, 1997 (Paper No. 14) wherein he states,

[h]owever, after correctly stating that "a 'product by process' claim is directed to the product per se", the Examiner then erroneously implies that the end product is the same as in Baker.

Furthermore, when the prior art discloses a product which reasonably appears to be either identical with or only slightly different than a product claimed in a product-by-process claim, a rejection based alternatively on either section 102 or section 103 of the statute is eminently fair and acceptable. In re Brown, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972).

To the extent that appellant is arguing that Baker does not disclose damaged regions, his position is unpersuasive. The n-type regions 13b of Baker are damaged regions of the lattice structure and they are adjacent to the electrically conductive material 23. The damage occurs during manufacture when the n-type regions are formed from p-type regions by ion bombardment.

Appellant's attack on the examiner's reference to U.S. Patent 4,411,732 to Wotherspoon in his answer is of no import because the reference is unnecessary to the rejection¹. The examiner merely notes that Wotherspoon details the conversion of p-type cadmium mercury

¹ Wotherspoon is specifically incorporated by reference in Baker

telluride (CdHgTe) to n-type material by way of ion implantation/etching so as to cause damage in the p-type CdHgTe material. At column 9, lines 29-35, Baker has a teaching to the same effect.

With respect to the rejection of claims 13-16, 19-22 and 25-28 as obvious over Baker and Mc Adoo under 35 U.S.C. § 103, appellant does not argue against the obviousness of combining the teachings thereof, but merely asserts the same alleged deficiencies of Baker. Because we have found no such deficiencies in Baker, we will sustain the obviousness rejection of these claims.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED

STANLEY M. URYNOWICZ, JR.)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
JAMES D. THOMAS)	APPEALS AND
Administrative Patent Judge)	INTERFERENCES
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